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Landscape Art in the Military Parks.

LAST week we spoke approvingly of some suggestions in *The Century* in regard to the construction and administration of the great national military parks which have been lately acquired by the Government. The first of these suggestions was that "Every commission should avail itself of the advice of the best landscape-architects so that park-like effects may be retained as far as may be consonant with the more practical objects of the reservation." One of our correspondents expresses strenuous dissent from this recommendation. He says that the idea of decorating a battlefield with garden finery is altogether repugnant to his feelings, and he adds that the work of the gardener is too petty to be tolerated in a place like this, where the grandeur of the natural scenery is more than matched by the moral grandeur of the event which this reservation commemorates. What with the monuments and historical tablets and lines of stone to mark the position of the soldiers, there would be, in his view, altogether too much art of one kind or another in the park, and he insists that what we want is more of nature—and nature without any artificial ornaments; certainly we do not want any gardener to dress up the landscape for visitors.

Beyond question the feeling which inspires this objection is a worthy one. The mistake is that the objector has no adequate appreciation of the true functions of an artist in landscape. Here are fifteen square miles of the Chickamauga battle ground, besides several outlying points which have been purchased, and which are to be made accessible for thousands of people, and all this is to be practically inhabited in the future by attendants and visitors which will increase in number as time rolls on. It is absurd to suppose that the face of the country will not be interfered with in some way by the constructions that are needed and by its continued occupation by man. Of course, the rivers and mountain ridges will always be there, and so, perhaps, will the forest, but the entire surface must be in constant process of change, and the problem is how to control and direct the unsleeping forces of nature and the persistent influence of man so that they will work together to preserve and develop the scenery of the great park in accordance with its real spirit and original meaning.

In the first place, there must be roads and paths for transportation. It is very clear that if an engineer is employed to make these roads his professional duty would lead him to consult, primarily, convenience and economy in construction, and the same might be true of the shelters and other necessary architectural work. Suppose, however, the design were in charge of an artist who not only appreciates scenery for its full value, but who by long practice knows why it is beautiful or sublime, and who is able to analyze it and judge which are its essential elements to be saved at all hazards. It is very plain that the landscape would suffer less mutilation under such conditions, since in all his efforts the leading purpose of the designer would be to preserve and develop that undefinable charm which appeals directly to the imagination. Again, such an artist instinctively apprehends the points of view from which the scenery makes its most impressive appeal. He would plan, therefore, to lead the spectator by pleasant approaches to where some inspiring prospect bursts upon his view, or where through opened vistas his eye can feast on well-composed pictures from which everything that distracts and belittles is shut out by a frame of foliage.

But, more than this, the country, if left absolutely alone, is undergoing perpetual transformation. Not only will trees be growing up—they will be dying. The mold will be washing down from the slopes and the mountains will grow more sterile as the valleys are enriched with booty from the hills. The competent artist in landscape will have a plan to guide all these forces in the direction of preserving the poetry of the scene. For example, if soil and leaf-mold are placed in pockets on the face of these almost perpendicular cliffs and appropriate seeds and plants are set therein just as nature does whenever she has time and opportunity, the characteristic appearance of such a place can be preserved forever, and even enhanced. A similar care in the woods can keep the trees in constant vigor, and along the raw road-borders trees and shrubs and herbs can be introduced that will harmonize at once with their surroundings, so that in a season or so foregrounds could be produced which nature would require a score of years to develop.

Work of this sort, we are aware, is not generally considered landscape-gardening. Our correspondent evidently considers that the field of landscape art is confined to making smooth lawns and bordering them with Golden Elders, Kilmarnock Willows and Purple-leaved Plums, with, perhaps, a beautiful pattern bed of Coleus and Alternanthera in the middle. Now, a true landscape-gardener does not consider a place trivial simply because it is small, and even the surroundings of a modest country house may bring out some of his clearest thoughts. Nor is his work entirely constructive, as it sometimes is, as, for example, in Central Park, where pastoral landscapes were absolutely created by blasting out a place for them from sterile ridges of rock. But it is quite as much the function of the true artist to preserve and develop and display to the best advantage as it is to create, and our great military parks will not be what they should be if they are turned over to an engineer to construct the roads, while every state and regiment is allowed to design its own monuments and select their position. It is very evident that if left to such chances the entire park scheme in every instance will be broken into fragments, not one of which has any proper relation to or coördination with the remainder. Not only will all sense of historical perspective be lost, but there will be no unity of purpose, nothing but groups of conflicting elements which assert in one place what is denied in another.

Beyond any question, each one of these parks should have a plan, an intelligent design to begin with and an ideal toward which it can grow for all time to come. No man of taste would ask to have anything foreign or fanciful imported into such work, but every one would take satisfaction in knowing that all the native beauty of the spot was to be unfolded under the charge of some real

artist who not only has respect for nature, but who is able to coöperate with her in perfect sympathy.

One of the speakers at the recent meeting of the Forestry Association at Springfield, Massachusetts, was Baron Beno Reinhardt von Herman, who is an attaché of the German Embassy at Washington. Baron von Herman has been sent to this Government as an agricultural expert, and inasmuch as he holds in the Civil Service of Wurttemberg the rank of Forest Assessor, it is evident that he is prepared to send to his Government intelligent reports about our forests, and to give our methods of managing them. It is to be hoped that he will learn something of value from our practice, but perhaps he can serve the interests of his country best by explaining the disasters that we are inviting by the utter lack of forethought that has characterized our great lumbering operations. Forestry has been practiced in an intelligent way in Germany now for many years, and able men are making it their life work to investigate subjects relating to forestry as a science and an art. And yet the German Government thinks it worth while to send experts to various countries in order to acquire more knowledge and present more facts for study and comparison. In our own country, where there is no such thing as scientific forestry, and very few persons give serious attention to this subject, the general opinion of the people and of the Government is that we know quite enough, and that our woods can take care of themselves. Congress cannot even be induced to oppose any check to lawless depredations on our wooded domain, and if it were suggested that we should send some one to other countries to acquire some knowledge in this matter the idea would be considered preposterous.

Notes on Western New York Woodlands.—II.

The tracts of timber which survived longest in large bodies were the swamps of Tamarack and Cedar, or those of flinty land covered with Oak, interspersed with Pine. These lands were the least desirable for the plow. Some of these tracts originally embraced several square miles, but are now much reduced or nearly gone. The straight, slender trunks of the Tamarack were in demand for poles, for ladders, or for pump-logs and underground conduits for water, since they were easy to bore and lasted well. The White Cedar went for fence-posts and railway-ties. When the land was drained the Tamarack died out, and the peat soil, exposed to sun and frost, gradually changed into good meadow-land, or provided a soil well adapted to truck-farming. The White Cedar did not so readily die out, since it frequently grows on higher lands.

The most abundant trees of the upland woods are the Beech and Hard Maple. On light soils, and where there is a considerable mixture of sand or gravel with the clay loam, the Oaks predominate, interspersed with Hickory, and sometimes with the Chestnut. In colder and higher tracts, or along the banks of streams, the Hemlock is frequent, or even abundant. The Basswood is common in the richer uplands, among Beeches and Maples. Here also the White Ash is most often seen. As the Basswood is one of the most desirable of the surviving trees for soft-wood lumber, it has been much thinned out, and good trees are becoming scarce. The larger trees are apt to be hollow at the base, and easily break off under sudden stress of wind. It has become a matter of common observation that it is not now easy to find a sound Basswood two feet or more in diameter, though this was not always the case. The trees, for some reason, seem subject to an earlier decay than formerly.

Where the Beech and Maple abound the White Oak is occasionally mixed with them, but is mostly confined to the low land, where it is much more common than the Swamp White Oak. The Red Oak is much more commonly seen with the Beech and Maple. In flinty and gravelly soils the most common Oaks are the White, Red and Black Oaks. Here also occurs the Chestnut Oak; it is usually less abundant than the other kinds and may also be found in the wet lands.

The changes that have been produced by clearing, exposure to sun and wind, drainage and pasturage, furnish a good opportunity to study trees in their powers of adaptation. Those which can most readily change, or have a greater range of conditions, or fruit most abundantly and germinate most easily, soon gain the mastery and become the predominating kinds. In the upland woods the Beech and Maple, wherever they grow, prove to be among the most aggressive and have increased in number of individuals relatively to others. In woods not pastured, or but little pastured, they spring up quickly, especially the Sugar Maple, and soon make a dense undergrowth or cover the more open spaces. So do the Oaks, Hickories and Chestnuts in their respective localities.

The tree which seems to have fared worst in this struggle for existence is the Black Ash. It was once very abundant in the swamps, the trees frequently outnumbering all other species combined. Now they are mostly dead or dying, and it is rare to find one leafy to the top. It was once the principal source of rail-timber in many localities. The suppression of the Black Ash has been caused by the drier conditions. Great changes have been made in the swampy lands. Those in which water stood throughout the year, except in very dry seasons, are now dry for the greater part of summer and fall, and can often be traversed dry-shod almost anywhere as early as the month of May. In wet situations the tree once flourished, rooting in the black swamp muck, the crowns of the roots rising much above the surface. When the swamps are dry the upper parts of the roots are exposed and they suffer like those from which the soil has been removed or burned away. When decay has gone far enough the trunks fall over. Though this tree can be adapted to drier conditions when young, seedlings do not successfully compete with those of White Elm, the Red and the Silver Maples, the species commonly associated with it in the swamps. These have now become the prevailing trees in the low grounds, and few young Black Ash trees can now be found in such woods. The Elms and the soft Maples have gained the mastery, and are also crowding the White Oaks.

Another tree which is becoming scarce in many places is the Black or Cherry Birch. It was once abundant in wettish lands. Drier conditions alone have not overcome it. More probably the young growth is destroyed by browsing animals, which relish its foliage. The larger trees have been used for cabinet-work, but there is little prospect of their being replaced if left to the common chances of the woods.

The Black Cherry has a similar use, and holds its own fairly well. Its seeds are widely scattered by birds, so that it springs up by fence-rows or in other favorable situations. Its bitter leaves and bark are not relished by cattle, and it has a fair chance of surviving when once started. Prunus Avium, or the Bird Cherry, which has escaped quite extensively from cultivation, has become a common tree by roadsides and the borders of wood-lots. It has invaded the woods to some extent, and holds a place there beside the Wild Cherry. I have seen it in the thick woods with a trunk a foot and more in diameter and fifty or sixty feet tall. It makes a forest-tree similar in habit to the wild Black Cherry, with its trunk as free from limbs when in the crowded woods. It may in time rival the Black Cherry in abundance, should it thoroughly adapt itself to wild conditions, since it is much less liable to attacks of the black-knot than the Black Cherry and Choke Cherry.

Though so much of the forest covering of this good agricultural region has been removed, a partial compensation in the way of shaded ground is found in the increased area of farm-land devoted to orchards. The land is in a measure tree-covered, sometimes as effectually as in the more open woods devoted to pasturage.

One noticeable result of this deforestation is the greater

violence of the winds. They sweep freely through the open spaces, and their strength and persistence seem increased. There is also more abruptness in local weather changes and greater contrasts in temperature. The average climate has not changed, but has been altered in its details. Hence the greater liability to frosts and cold winds, which are sometimes nearly as damaging to the fruit crop as the frost. While in the region during the changeable weather of May of the present year, I examined some orchards after the results were fully apparent. Those trees fared best on the eastern slopes of hills or east of belts of wood. Where the fruit was not entirely destroyed, a difference was perceptible between the east and west sides of the same tree. The cold wind which preceded the frost came from the west, and when it subsided the localities most affected were those which had been exposed the longest to its influence. In the low ground, where the cold air settled, there was less difference in this respect even in sheltered areas.

It is also evident that fields are more subject to dryness in a deforested region. This is not on account of a diminished rainfall, but from the lack of conservation of the water which falls. It runs off quickly from the fields, hurried on by the the ditches and open waterways, or is more rapidly dried up by the sun. The effect upon the streams is clearly seen. They rise suddenly, and are full to overflowing in the rainy season or after heavy showers, but are low or dry at other times. Brooks that were once perennial are dry for a great part of the year. The springs which feed them and tend to keep them running are mostly along the bases of the hills. They once provided water in the pastures for the stock. Now they are more uncertain, more often go entirely dry, and resort must be had to wells, which go deeper into the ground.

It is not a region that washes badly, partly from the character of the soil, partly because the hillsides are kept in grass when not covered with other crops, still much of the soil is carried down into the valleys or hurried off in the turbid waters of the swollen streams. On the hills, especially the steeper ones, there is a tendency of the soil to become poorer and thinner. The fact might be hard to demonstrate, but it is highly probable that the region has already been denuded of trees beyond what is needed for the best agricultural results. With more of the hills, or especially their steeper sides, left in forest, the land in the valleys and on the gentler slopes would evidently be better watered, more productive and more certain to yield a remunerative crop.

Chicago, Ill. *E. J. Hill.*

Autumnal Changes in Leaves.—I.

THE gorgeous autumnal foliage of our temperate climate appeals to us all in different ways. Poetical and theological views of this phenomenon are interesting and elevating, but they hardly satisfy people with scientific curiosity. The variety of these colors is surprising if we compare them, for instance, with the plates of Ridgway's *Nomenclature*. There are the ochre-yellow of the Poplar and the closely allied, yet distinct, hues of Milkweed, Elm and White Maple; the orange of Sassafras and Black Birch; the crimson of the Huckleberry, Sumach and Woodbine. Many plants, such as Sumach and Red Maple, show beautiful combinations of yellows and reds, especially when these colors are relieved by more or less green. In Red Maple leaves, one who is not color-blind may distinguish orange, scarlet and vermilion, rose-pink, lake-red, rose-red, carmine, crimson and maroon, to say nothing of orange, orange-buff and ochre-yellow. Purple hues are not common, but are found in some Oaks, among the botanically troublesome Asters, and elsewhere. Sober brown leaves show exquisite varieties of color before becoming part of mother earth. Sassafras leaves become russet; raw umber is the hue of Scrub Oak, and Buttonwood leaves assume a rich Vandyke-brown.

Before venturing upon some explanation of the way these colors are formed, it may be well to state that autumn leaves are best preserved by covering them with a sheet of paper, pressing with a hot iron upon which paraffine has been rubbed, and flattening and drying between papers afterward. Leaves thus prepared will retain flexibility and color for years, but if pressed without paraffine they will soon become dull and brittle.

It will be found instructive to record the dates at which various kinds of leaves change color, for comparison of such dates shows, in a rough way, the relative vitality of different species of plants as well as of individuals of the same species. Early in July, in the vicinity of Boston, the root leaves of many tender herbs and the oldest leaves of Sumach begin to change. Near the end of the month many leaves of Elm and Maple color and fall, but such leaves are noticeably small and often deformed. By the first of September a wholesale coloring has begun among Blueberry, Blackberry, Sumachs and other plants, although Maples, Oaks and Poplars are not generally changed. Before the end of this month Red Maples are intensely colored, while Sugar Maples are not at their brightest until the middle of October, in company with the Poplars. Last of all come Dogwood and Scarlet Oak, alone in their glory among the withered leaves of late October.

Our autumnal colors are admitted to be much more brilliant than those of Europe, where Maples and Oaks are notably fewer in number and variety. Yet the brilliancy is relatively less in the old country if we compare similar trees in corresponding climates or observe American trees when cultivated abroad. This is, doubtfully, attributed to the "greater transparency of our atmosphere and the consequent greater intensity of the light," but no exact observations upon this subject have yet been made.

Certain it is that intensity of light has an important bearing upon the color changes of leaves. Exposed leaves are colored sooner and stronger than shaded ones, other things being equal. Yet the oldest, or first exhausted, leaves of a plant are the first to turn, even when more or less shaded, as also occurs with stunted leaves of low vitality. Again, a green leaf of Red Maple, artificially darkened when about to turn, undergoes no striking color change. If a part only is shaded, as by a strip of tinfoil, that part remains green, while the rest becomes yellow. If part of a yellow leaf is shielded from sunlight it stays yellow, while the rest may turn red. The infinite diversity of color distribution in autumnal leaves is, I believe, largely due to the varying amount of shading from sunlight which any individual leaf undergoes from other leaves, etc. I have found a crimson Sumach leaf crossed by an oblique yellow band where a branch had pressed upon it; also upon a red leaf of Maple a distinct photograph of an overlying leaf. A person's initials cut from paper and pasted upon a green leaf or fruit will be sharply defined in green after surrounding parts have assumed shades of red or yellow.

Now, for an adequate explanation of these effects of light, or better, light and heat, we suggest the following: The leaf is a transitory structure whose length of life is adapted to the character of the climate, and soon grows to its maximum size, which then limits its capacity for the preparation of food. This assimilation, occurring in a green leaf and only during sunlight, necessitates the continual formation and accumulation in the leaf of certain waste products, which must gradually reduce the amount of assimilation itself. The leaf is choked by its own excretions, and, becoming less able to repair its normal waste of tissue, succumbs more readily to oxidation. The heat accompanying sunlight not only furthers assimilation—in fact, is essential to it—but also hastens the death of the leaf by accelerating the combination of oxygen with its tissues and the action of acids which are formed in leaves as by-products. The effect of shading leaves from sunlight, then, is simply to retard not only the normal assimilation, but also the subsequent disintegration, which is indicated by color changes, and is just as normal in its way. In fact, leaves and bark are the excretory systems of plants, for by their means useless chemical compounds are periodically re-

turned to the soil; and the fall of the leaf is an intentional phenomenon, so to speak.

More or less moisture in summer is noticeably followed by a corresponding greater or less brilliancy of color in autumn. During a moist summer the cuticle of a leaf remains thin and its colors are vivid. In a dry summer, however, this cuticle becomes thicker and harder, in order to prevent an injurious loss of water from the plant; and while bright colors may form within the leaf, they appear dull because seen through the more opaque skin or epidermis. The bearing of this upon the relative brilliancy of American and European colors is plain.

It is a popular belief that autumn leaves are colored by frost in some vague way. This is easily disproved, for a Maple frequently assumes its blazing colors in hottest summer. Moreover, it is really hard to see any perceptible acceleration of color development after frost has occurred.

The best-accepted explanation attributes the yellows and red to the action of atmospheric oxygen upon the normal green coloring matter of leaves, a process somewhat comparable to the rusting of iron. Many facts favor this view. We know, by direct experiment, that the green parts of plants absorb oxygen at night and exhale the same kind of gas during sunlight. Now, when leaves begin to turn they cease to exhale oxygen, but continue to inhale it, in gradually diminishing amount, as coloration continues. Coloration is, therefore, correlated with retention of oxygen in leaves, and chemical examination of the yellow and red pigments shows they are probably made in many cases by oxidation of the original green one. Chemically speaking, the "Poison Ivy, blushing its sins as scarlet," performs this touching act by disintegrating its chlorophyll into compounds of the erythrophyll and xanthophyll groups.

This green coloring matter of plants, chlorophyll, is of vast physiological importance, for it is absolutely essential to the process of assimilation. Fungi, naturally devoid of chlorophyll, always steal their food, ready made, from other plants which have made their own living. A seed grown in darkness ceases growth when the food stored in the seed itself is exhausted. No new food can be made without sunlight, and the plant is yellow, except in a few cases. This yellow color is frequently seen in grass which has grown under a board, and is due to a pigment called etiolin, which is always antecedent to the formation of the green pigment in sunlight.

The color of a healthy leaf is made by a multitude of green granules, usually roundish, distributed in most of the sacs or cells of the leaf. Each granule is essentially a particle of that formidable protoplasm, "the physical basis of life," and resembles a sponge which is colorless itself, yet is saturated with a green liquid consisting of oils in which the pigment is dissolved. It must not be supposed that chlorophyll itself can assimilate food. A solution of chlorophyll is incapable of absorbing carbon dioxide to form organic matter from that gas and water and eliminate oxygen; but this power is possessed by each protoplasmic grain in which the green pigment is lodged.

Essential as this pigment is, its physiological action is involved in doubt. A very plausible theory is that chlorophyll absorbs red rays of solar light which would most injuriously heat plant tissues and facilitate the combination of oxygen with them; yet, considering the extensive researches made upon chlorophyll by keen investigators, it is surprising that we still know so little about it. It has been impossible to obtain the pure pigment owing to the difficulty of removing various oils, fats, etc., always associated with it; also because it rapidly decomposes into other substances, so that the chemist is not sure whether he is juggling with chlorophyll or with some of its derivatives. We shall, however, state those best-ascertained properties of chlorophyll which are important in this connection, and will then indicate how the fundamental green pigment is probably altered to form conspicuous autumnal colors.

Cambridge, Mass. *Justus Watson Folsom.*

New or Little-known Plants.

Agave Utahensis.

OUR illustration on page 385 of this issue will give some idea of the appearance of the vegetation that clothes the bluffs and cliffs which rise from the slopes of the Grand Cañon of the Colorado, in northern Arizona, at the point where the river rushes along the bottom of an abyss six thousand feet deep and some thirteen miles across at the plateau level. In the centre of the illustration is a plant of Agave Utahensis; on the left is Echinocactus polycephalus, and in the foreground appears an Opuntia erinacea, Cereus-like in appearance with its narrow, thick, long-spined joints, and very abundant in northern Arizona. The slopes of the cañon are dotted with these and other inhabitants of the desert, but the great Colorado plateau, which is divided by the cañon, is covered with a splendid open forest of the Yellow Pine, Pinus ponderosa, which in northern Arizona and southern Utah forms one of the largest continuous Pine forests of the world. The Pine occasionally extends over the rim of the cañon, and with it other trees and shrubs grow down the sides for a distance of a thousand or fifteen hundred feet; among them are the White Fir (Abies concolor), the Douglas Fir, the Nut Pine, the Utah Juniper, Cowania Mexicana, the curious simple-leaved Ash (Fraxinus anomala), a flowering Ash (Fraxinus cuspidata), the western Shad-bush and Ostrya Knowltoni, one of the rarest and most local of all North American trees, and, up to this time, only known at one place on the slopes of this cañon. It is this mingling of northern and southern plants, the inhabitants of northern mountain forests with the Agaves and Cacti of more southern and more arid regions, which makes the Grand Cañon, which is one of the natural marvels of the world and a spot unsurpassed in this country in grandeur and picturesqueness, such an interesting botanical ground.

Agave Utahensis was discovered several years ago by Dr. Edward Palmer near St. George, in southern Utah, and was first described by Dr. Engelmann in Watson's report on the botany of the country along the fortieth parallel of north latitude explored by Clarence King. It is one of the species (Geminiflorae) in which the flowers are borne in pairs in the axil of a bract on a tall scape, and form a dense elongated spike. The leaves of Agave Utahensis are lanceolate, concave, thick, hard and glaucous, long-pointed, twelve or fourteen inches long and from two to three inches broad, with pale terminal spines and broad white lateral teeth. The slender spike of bright yellow flowers is three feet long, and is often raised on a stem seven or eight feet high. When the plant is in flower and when the flowers are succeeded by the pale yellow pods which do not fall until late in the autumn or the beginning of winter, and long after the time when they open and shed their seeds, the tall wand-like spike waves backward and forward, and, flickering in the sunlight, enlivens with its strange and wonderful beauty the dark forbidding slopes of rock which this plant selects as its favorite home.

Plant Notes.

Billbergia Liboniana.—During the late summer this is a very showy plant for the conservatory. It is one of the most highly colored of the Billbergias, which, taken together, constitute a most beautiful genus. Twenty or more flowers are borne on a close terminal spike; they are about two inches long, rich scarlet, tipped with blue; the petals are more or less recurved, and the sepals half the length of the petals, rosy, fading to white at the base. The anthers are bright yellow, and the stigma blue. The numerous bracts below the flowers are lanceolate, two to three inches long, membraneous, a bright rosy color, the largest crowded immediately below the flower-spike. The scape is twelve to eighteen inches high, white, covered with large rosy bracts. Leaves lingulate, two to three

inches wide by ten or more inches long; ten to twelve in a dense rosette, pale green, and a deep violet-purple inside at the base. The flowers of this species are more showy, but not as lasting as those of B. rhodo-cyanea.

RESTIO SUBVERTICILLATA.—This is a showy plant which is rarely seen in greenhouse collections. Its scarcity is probably due to the fact that it is of slow growth and difficult to propagate. In its native country it is known as the Rope Grass Plant. The thin, wiry stems are covered with an immense number of long grass-like spikelets, which give to it a graceful feathery appearance. It grows about eight feet high and is considered by many quite as ornamental as Papyrus Antiquorum. Unlike the latter plant, however, it only needs a temperature in winter sufficient to keep out frost. This Restio is sometimes met with under the name of Willdenovia teres, an entirely different thing.

VIBURNUM OPULUS.—Among the most interesting shrubs in Prospect Park now are the so-called Cranberry Trees, whose bright berries have now come to their best color. Many of the Viburnums, native and foreign, are worth planting for their fruit alone, but none of them are more conspicuously beautiful in this respect than this native plant, after its cymes of round drupes have turned to their clear red color. We call this a native shrub, but it ranges quite round the globe, being found in northern Europe and in northern Asia, as well as in this country, and it may be worth repeating that some of these Viburnums now growing in the Arnold Arboretum, from seed obtained on the mountains about Pekin, have a greater decorative value than either the American or the European forms. The sterile ray flowers of these Chinese plants are much larger, and the anthers, instead of being green, are bright purple. The fruits of V. Opulus remain on the branches for weeks, or until the birds are driven to eat them for lack of other food, as they do not seem to relish their acid flavor. Often they cling to the branches until the next spring and retain their bright colors to a considerable extent. Although this Viburnum is not nearly as common in gardens, it is preferable for many reasons to the Snowball or Guelder Rose, which is nothing but a monstrous form of it, in which the flowers are all sterile. Of course, the Guelder Rose never bears any fruit and is, therefore, to this extent inferior to the fertile plant. The Guelder Rose is also much more subject to the attacks of the aphis, probably because it has become weakened by long propagation from cuttings, instead of being renewed from seed. We ought to add that V. tomentosum, another Asiatic plant, bears the same relation to the Japanese Snowball, V. plicatum, that our High-bush Cranberry does to the common Snowball. This plant was figured and described in vol. iv., pages 594-5. We have never seen it in fruit in this country, but in habit as well as in flower it is preferable to the sterile V. plicatum, and is in every way a shrub of merit.

CLEMATIS VIRGINIANA.—Although one of the most common, this is one of the most graceful and beautiful of our native climbers, and no plant adds more to the beauty of our roadsides or swamp borders. It is usually found rambling over masses of shrubbery, and in August every branch is a long festoon of cream-white flowers, which appear in axillary clusters. These are not quite so delicate as the pure white ones of Clematis flammula, but they are very fragrant. These flowers are followed by clusters of fruit with feathery gray tails, and these appendages to the seeds glitter in the autumn sun like masses of flowers. This common Virgin's Bower thrives under cultivation and makes a wonderful growth in deep, rich soil. In large places it can be planted to advantage in the shrubbery, but, in fact, it never is so beautiful as in a wayside thicket. Some plants bear only staminate flowers, and if the fruits are wanted, plants should be propagated only from individuals with perfect flowers.

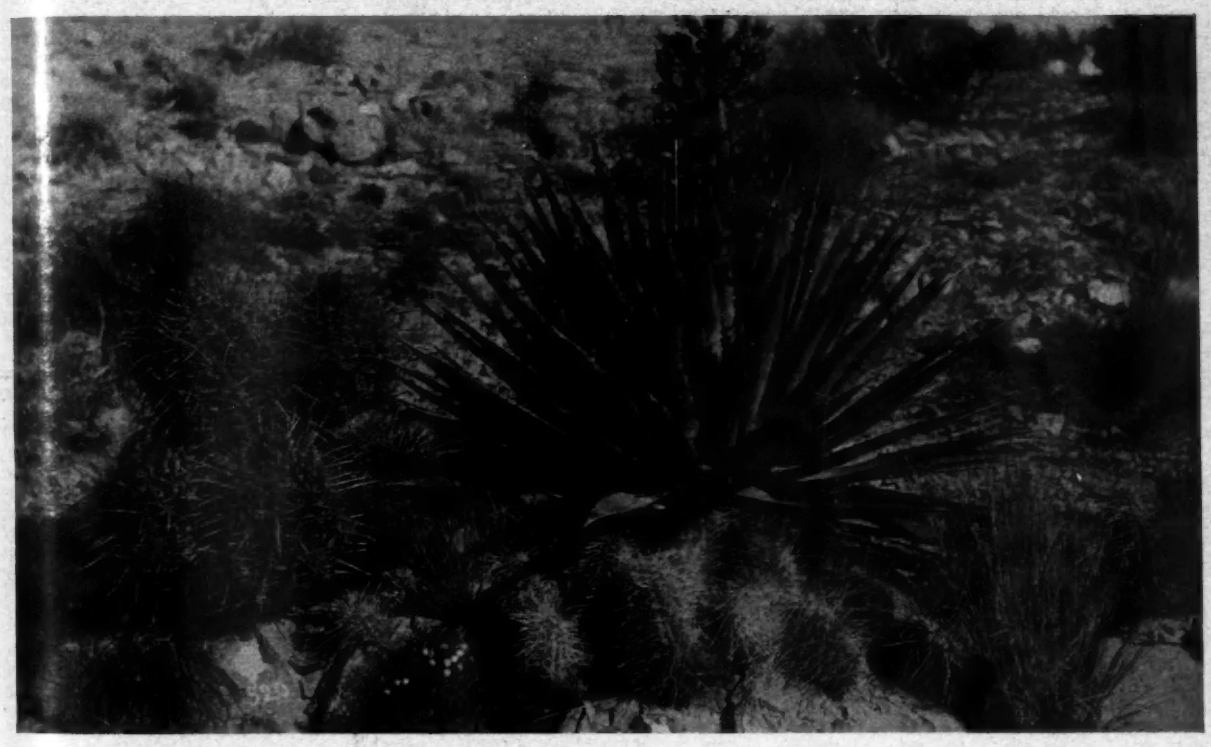

Fig. 53.—Agave Utahensis in the Grand Cañon of the Colorado, Arizona.—See page 384.

Cultural Department.

Gardening in North Carolina.

WE tried, last winter, several plans for the protection of Fig-trees, and the uncommonly cold winter gave us an opportunity to test their merits, for all unprotected Fig-trees here were badly cut back. While we did not have at any time

the intense cold experienced here in January, 1893, the cold was longer continued and more trying. Most of our Figs are branched from the ground and can easily be bent down for winter protection. Some of them were thus bent and covered with earth, just as I had treated them, with success, in northern Maryland. Others were bent down and secured by pegs with hooks and were then covered with evergreen boughs. A few that were of such erect habit and so stout that they could not be bent to the ground, were thatched over the trunk and limbs with straw. The buried trees suffered badly; nearly all the young growth rotted off, and many large limbs were decayed in the spring. For all the cold there was too much soft and wet weather for the earth cover to be a success. This has been our experience with buried Fig-trees here for two winters—a warm and a cold one. The first winter we tried it there was no need for any protection, and the trees came out worse than those that were unprotected, but we supposed that the plan would be a success when we found what a hard winter was on us. It seems evident that this method will not do in the south, though I was perfectly successful with it for six consecutive years in northern Maryland. The trees that were merely covered with Pine boughs came out in better condition than the buried ones, and were the ones to give us our first early figs, though even on these most of the early crop, which is already set in fall, was destroyed. But the White Marseilles gave us some remarkably fine fruit. The trees that were thatched with straw were all of the Celestial variety. These came out in fine condition, and have been giving us fruit continuously since the last of July. Whether any other varieties would have done as well with the same treatment remains to be proved, for the Celestial is rather more hardy than some others. A lot of over one hundred plants, four years old, grown from seed of the best layer figs we could find in the stores, were left unprotected and were cut back badly. Nearly all of them have this year set late fruit, which will hardly ripen.

Last spring I turned out from pots some plants of Araucaria Bidwillii, and left one out entirely unprotected on the north front of my house. The winter that followed was a hard trial to a young green plant, without any old woody stem, and it was killed to the ground. We supposed it entirely dead, but to our surprise it has grown from the base, and if it could be assured of a few mild winters I believe it would finally stand well, though it is not as hardy as A. imbricaria.

Last summer our Neriums were the glory of the neighborhood and were in profuse bloom all the season. There were ten plants, all four years old. Last winter finished all but one, though we had them thatched with straw. The one that survived lost its top, and now has grown a new one three feet high.

We are delighted with Spiræa Anthony Waterer. Our little plants, set from three-inch pots last spring, have been in profuse bloom all summer, and are still blooming. Their dwarf habit and numerous flowers will make this variety valuable for the borders of shrubbery. With us the flowers are of a more brilliant color than those of S. Bumalda.

The hard winter prevented Pyrus Japonica from blooming as it usually does in January and February, and the result is that our bushes are now laden with the golden aromatic fruit. Those who have never seen this fruit perfectly ripened have no idea of its delicious and pervasive odor. Has any one ever tried them for preserving? They are totally inedible raw, but so is the big Chinese quince, which makes a delicious preserve. We have so many I propose to try them.

I have been long convinced that our southern gardeners neglect the Hybrid Perpetual Roses too much. I find that most of them bloom more freely here than they do farther north. On my lawn this summer there has not been a day since early May when I could not cut flowers from some Roses of this class. The new variety, Margaret Dickson, is particularly floriferous, and is still giving us flowers; in fact, it has averaged as many flowers as many of the Tea Roses. The ease with which we can propagate these Roses, from long cuttings set in the open ground in the fall, should make this hardy class more popular here. I have never seen mildew on a plant, though lately the leaf-spot has been doing great damage, and we will need to begin spraying another year. I am disappointed with Crimson Rambler. I bought an extra-sized plant, and it has grown with remarkable luxuriance, but not a flower has it made the whole summer. There have been so many accounts of its wonderful profusion of bloom that the failure of a big plant to throw a single flower is a surprise. Perhaps it will redeem itself next year. If it does not I shall bud something better on its robust stem.

Solanum Seaforthianum has made a remarkable growth, but it, too, makes too few of its pretty clusters of blue flowers. S. grandiflorum has gone to the top of a tall piazza, but has not shown a single flower-cluster. Antigonon leptopus survived the frost, but has made a stunted growth, and will have to hurry if it makes much bloom; but as I transplanted the mass of roots in the spring, that may have retarded it to some extent.

We have fruited eighteen varieties of Mr. Munson's Grapes this season. Some of them are really fine, and most of the others will be useful as stocks for better varieties.

North Carolina Agric'l Exp't Station, Raleigh, N. C. *W. F. Massey.*

Bulbous Plants.

IT is always with surprise that one discovers, some fine autumn morning, the glowing vases of the Colchicums, curious plants which send forth naked flowers many months after the vigorous growth of foliage has passed. The bare ground seems especially harsh under the flowers, and these bulbs should always be grown among grass which is seldom mown, or among carpeting plants, since these will serve as a foil to the flowers. C. speciosum and the single white are both satisfactory autumnal kinds, reliable with ordinary care. The double white-flowered sort is more rare, and is distinct and pretty with its many narrow petals. Except a few species of Crocus and Sternbergia, the hardy bulbs will not show any more flowers until the first thaw of the new year, unless, perhaps, some precocious Snowdrops venture their blossoms before the rigors of winter begin. The lengthening leaves of the Grape Hyacinths indicate that the winter and spring flowering bulbs are waking up under ground, and most of the hardy bulbs will be found to have made some root-growth, or, at least, to give signs of new life at their bases. This is a warning to plant all such bulbs as soon as possible, that they may not suffer any check and become well established before they are bound by frost. There is no doubt that many bulbs do better for being lifted and dried off, especially if they have been grown in a naturally moist ground, though some of the advantage probably comes from the change of soil. The drying off should not be too prolonged, and there will be no benefit if the bulbs are kept out of the ground some time after they would naturally move. Most deciduous bulbous plants seem to have sharply defined habits as to starting-time, and interference with them in this particular is often resented.

Bulbs are interesting in their potentialities and varied habits, and there can scarcely be too many of them in a garden. Thickened root-stocks, except those known as corms, classed in gardens as bulbs, are usually most tenacious of life. Besides showing many of the most gorgeous flowers, they make it possible to utilize garden space to the best advantage, especially in the early year. The most complete garden, and the one producing the greatest abundance of flowers for the space, will contain a careful selection of hardy plants among which are grown bulbous plants, which in due time are covered with annuals. Succession is the keynote of good gardening.

Bulbs should be secured as soon as possible, not only for the garden, but for the house. All bulbs should be potted at once, even if they are required for succession. It is an easy matter to retard them, and they will become better established if potted early. The Dutch bulbs make the best show and are easily handled if planted in shallow pots known as Lily pans. An eight-inch pan will hold four good Hyacinth bulbs or five to six Roman Hyacinths.

For my small greenhouse I find the most satisfactory winter occupants are small decorative plants, Palms and Ferns, Orchids, a few Begonias, and some odd favorites which have a permanent place here. This collection is supplemented by the various Dutch bulbs which are brought in from time to time from the cache outside. A fairly good and continuous supply of desirable flowers is secured by this procedure, though the house becomes rather congested in late winter with potted bulbs which have not yet ripened. The Orchids which I have accumulated in the last few years have flowered satisfactorily and interested me greatly. They have disappointed me entirely in only one respect. Having read many directions giving elaborate details of cultivation and treatment I gained the impression that they were plants for the skilled professional only. There could be no greater mistake as regards many of them, if a few simple requirements are observed. With the inclination to water too freely I am more apt to kill Begonias than any of the Orchids, which generally seem to be endowed with wonderful vitality. Any one who can grow a Geranium need not hesitate to grow the Orchids which require an ordinary greenhouse temperature. The resting period should always be noted, and a lesson in potting taken from an expert. No plants enjoy a full supply of fresh air more than Orchids. I do not grow these plants because they seem to me

the handsomest of flowers, but simply because they are somewhat unique, give good results for the space occupied, and require less attention in many respects than plants of more rapid and softer growth. Besides, an amateur will usually find the most satisfaction in growing the plants which are not adapted to or are unprofitable for commercial culture. There is no special satisfaction in devoting a small house to Roses, Carnations or other flowers that can be had from the neighboring florist.

Elizabeth, N. J. *J. N. Gerard.*

Flower-garden Notes.

FROSTS have occurred much earlier than usual this year, and on September 15th Alternanthera, Coleus and other tender bedding-plants were completely blackened in many places. Generally our first frost does not come until about October 10th. We prefer to lift a few old plants of Coleus and grow these during winter in a moderately warm house. The plants, by judicious pinching, are highly decorative, and a few will furnish a large quantity of cuttings. We lift old roots of Alternanthera, trim the plants within reasonable bounds, and plant them quite thickly in boxes, which are placed on a shelf in our Rose-house. Of Stevia, Achyranthus, Santolina and other foliage-plants we pot a few old plants of each, and they yield an abundance of spring cuttings. Among the newer bedding plants, Strobilanthes Dyerianus has grown strongly, but its weedy habit is not likely to commend it for extensive future use. Abutilon Souvenir de Bonn is the handsomest Abutilon we have grown. It attained a height of six feet here, and for tropical beds or planting as individual specimens in mixed borders it can be highly recommended. Phrynium variegatum has grown well; the leaves show but little coloring, although grown in a well-exposed situation. We tried some fancy-leaved Caladiums in the open this year; they were set in the full sunlight and have made surprisingly good growth, much better than those in pots. These plants were thoroughly wet with the hose every evening during the hot season and occasionally watered with liquid-manure. This experiment shows that Caladiums, under favorable conditions, may be fairly well grown in the open air, even in New England.

We generally put our Geranium cuttings for bedding into boxes the first week in October. The boxes are filled half their depth with broken pot sherds or shells. Over this we place a layer of sphagnum and fill the balance with sand, which is pressed firmly and watered before the cuttings are inserted. A good soaking is given after the cuttings are in, and the boxes are placed on a shelf close up to the light in a Carnation-house. They require no shading, and the only attention necessary until potting-off time in spring is an occasional watering to keep the cuttings from shriveling, and the removal of any decaying stems or flowers. Fully ninety per cent. of the cuttings should be carried over safely. The popular variety, Madame Salleroi, is so easily propagated that a few old plants only need be potted up to secure a large stock of spring cuttings.

Tuberous Begonias, after being killed by frost, should be lifted and laid on a dry shelf in a greenhouse or warm shed. When sufficiently dry we store them in boxes of dry sand and keep them over winter in an ordinary potato cellar. Flowering Cannas should be looked over and carefully labeled before frost comes. If this is not done the varieties are liable to get badly mixed. We always pot a few of each of the best kinds, as they are admirable winter bloomers and brighten the conservatory and greenhouse when showy flowers are none too plentiful.

Tender bedding plants should be cleared away soon after they are cut down by frost. After the plants are removed we have our beds manured and dug over; some gardeners allow this work to wait until spring, but there is enough to be done then which cannot be done in the fall. Dutch bulbs are now arriving, and as these lose vitality while in paper bags, they should be planted out as early as circumstances will permit.

Lawns and drives will be untidy for some weeks to come on account of falling leaves. They should be raked over at least once a week. Newly seeded lawns should be rolled after heavy rains, when the soil is not pasty. Grass verges should be clipped for the last time. Beds, if neatly dug and bordered, help the appearance of a place greatly; too often they have an appearance of utter neglect from October until the next bedding season comes around.

Perennial borders now have a rather disheveled appearance. Frost, heavy rains and high winds spoil their beauty, but varieties of Helianthus, Asters, hardy Chrysanthemums, Anemone Japonica, Colchicums and other plants are still flowering luxuriantly. The best time to transplant perennials is during October; it is well to take note of the heights of the various plants and mark those it is intended to remove. Hardy plants removed to fresh quarters at this season will, of course, give much better satisfaction than those planted in spring. The ground should be kept well stirred among Sweet Williams and other biennials in nursery beds. Some varieties of these, such as Antirrhinums, Wallflowers and Daisies, we plant into frames about the end of October. Pansies we usually prick out early in October, setting them about four inches apart each way.

Summer-blooming Carnations will continue to flower for some time unless there is severe frost. They should be kept tied up securely to prevent heavy rains from soiling the flowers. We grow late Asters in cold frames, and are thus able to protect them in case of early frost. Those grown in the open, if lifted with balls of earth and planted in frames, will furnish good flowers until Chrysanthemums bloom. Cosmos is a useful flower in October. The plants should be tied to stout stakes, as they break with very little wind. We placed the sashes on Violet frames about September 15th; they should be kept on at night and removed during the day when the weather is warm. We run a lath shading over the plants for a short time during the hottest part of the day, until the first of October. Runners, weeds and decaying foliage should be removed each week, and the surface soil stirred frequently. A sharp lookout must be kept for signs of spot; badly infected plants should be pulled up and destroyed, and a spraying of Bordeaux mixture given to all others. At no season of the year does the disease spread more swiftly than now, and it is necessary to be on the alert to counteract it.

Taunton, Mass. *W. N. Craig.*

Two Good Grapes.

TWO grapes that can be very highly recommended to lovers of spicy rich fruit are the Hayes and Eldorado. Both of them are very early, ripening this year by September 5th. Hayes may be classed as about three days earlier than Eldorado. It is a large white grape, about the size of Diamond, and much the same translucent color. It is not a rank grower, but is a fairly good wine-maker. The flavor is sweet, but sparkling, and nearly as rich as that of Lady. The seeds are few and very small. This is an item of very great importance, as many of our best grapes fail at this point. Nearly all of Rogers' Hybrids, for example, have large seeds and many of them. Hayes is a good keeper, on or off the vines, and has no tendency to drop from the cluster. Rot rarely attacks it.

Eldorado is in most ways a close likeness of Hayes, and has a reputation of being a shy bearer. My own experience with it indicates that it is not quite a perfect self-pollenizer, but when grown with other grapes it is a fine cropper. The color is less showy than that of Hayes when fully ripe. Possibly the flavor is a trifle more spicy, like that of the Lady. But these two grapes should find a place in every collection where quality is appreciated.

Clinton, N. Y. *E. P. Powell.*

Solanum Wendlandi.

ONE of the most promising novelties of recent introduction is this climber, which, although not a new plant, strictly speaking, has only recently been made available to cultivators on this side of the Atlantic. There is an excellent figure of it in *The Garden*, February 1st, 1890, the color of the flowers being, perhaps, a little darker than is the case with plants grown here under a stronger sun. No climbing plant of my acquaintance will cover so much space in a short time as this one. Our plant was a small one, set out in a bench in a greenhouse, and in six weeks covered as many feet each way with a strong growth of rich, dark foliage and many large heads of flowers, some of these over a foot in diameter. The individual flowers open in succession until all have expanded, so that each head of bloom is a thing of beauty for at least a month. The flowers are nearly two inches in diameter and of a pale lavender-blue. I saw it recently growing in the succulent house at Kew, where it was luxuriating in full sunshine and plenty of air, and it seems to me that there is a use for it as a summer climbing plant for outdoor planting in this climate; of course, in warmer sections it should prove hardy, and it would then be a deciduous plant. Wherever this Solanum is used it must have a good rich soil to grow in, as it is a great feeder and cannot be treated too liberally. In the issue of *The Garden* referred to we are told that "Kew is indebted for this Solanum to Mr. Wendland, Director of the famous Botanic Gardens at Herrenhausen, who sent a plant of it in 1882, with the

information that it came from the colder regions of Costa Rica." As Director Wendland went to Central America in 1858-59 on a botanical mission, it is to be presumed that he brought home this among the many plants collected, and the wonder is that it has remained so long hidden from cultivators; there seems to be no difficulty in propagating it from cuttings made of the least succulent shoots, and we may soon see it largely used as a decorative plant.

It should be noted that the flowers close up at nightfall. This defect or peculiarity hinders their use in a cut state somewhat, but it will not be considered much of a detraction from the value of the plant if used as a climber, either indoors or out in the warm months.

South Lancaster, Mass. *E. O. Orpet.*

[In many of the gardens of San Diego and Santa Barbara, California, Solanum Wendlandi is now well established, growing to the height of thirty or forty feet, and displaying during a large part of the year its clusters of beautiful flowers.—Ed.]

Keeping Pears.—If pears are wanted for late fall and winter eating pick them early and handle as carefully as possible. Get a package of paper, such as is used to wrap oranges, and wrap each pear separately. Then pack the fruit in shallow boxes and store in a cool, dark, dry place. The nearer the temperature can be kept to the freezing-point the longer the pears will keep. By wrapping in paper the flavor is not lost as it is when pears are kept in cold storage. Early picking and perfectly sound specimens are essential.

Plant a few Winter Pears.—Nearly every one likes pears, yet few have the fruit after Thanksgiving or Christmas. Much attention has been paid to late-keeping pears during recent years, and there is now quite an extensive list of fine table varieties that keep well into the winter and spring months. Winter Nelis is best known, but Lawrence, Josephine de Malines and Duhamel du Monceau are deserving of a place in every garden. Colonel Wilder and P. Barry are pears of more recent introduction, and while neither of them is a good grower, the fact that they keep until March and April makes them valuable to the amateur.

New York. *Edwin C. Powell.*

Correspondence.

What Shall We Do with the Birds?

To the Editor of Garden and Forest:

Sir,—Most of us have been taught to reverence the birds, and we are inclined to resent at once any evil report with regard to their behavior. The ornithologist demonstrates their usefulness by presenting long lists of the insects found in their stomachs, and, even if we are not convinced of the actual good they do, we enjoy their beauty and their songs, and are glad of an opportunity to befriend them; yet, in spite of this sentiment, I do not recall an enemy which I consider more serious in this region than the birds, or a greater obstacle to profitable fruit-growing. Last year (Garden and Forest, vol. vii., page 414) I called attention to the injury done to apples by birds. It was there suggested that, as the season had been exceedingly dry, the ordinary supplies of bird-food might be deficient, or that the birds might attack the apples to get the moisture contained in them. We find, however, that their conduct this year is no better; in fact, it seems to be worse, for the reason that they have had better opportunities to exercise their evil propensities.

Of course, the birds are expected to take a liberal supply of cherries, juneberries and the like, but Nebraska birds are not to be put off with any ordinary division of proceeds. In the Experiment Station orchard they render the crop of summer and fall apples practically valueless, for scarcely an apple reaches maturity uninjured. To be sure, there is a part of nearly every apple that can be utilized for home use, provided it is wanted very soon after the bird takes his share of it, but this necessitates picking the fruit almost daily.

The trouble does not stop with the orchard, however. This year there are a few grapes, and the birds claim even a greater share of these than of the apples. I have not been able to find a perfect cluster that is even well colored, not to say ripe. In all cases the grapes are attacked as soon as they begin to color, and in many cases not a perfect berry can be found. To be sure, the crop is a poor one, the frost having destroyed the greater portion in early spring, but I am told that the result is not greatly different in many cases even when the crop is large. Of course, the clusters can be protected by bagging, but with grapes selling at retail now for twenty and twenty-five cents for a nine-pound basket, there is little encouragement in undertaking grape-culture for profit with the expectation of having to bag every cluster that is harvested.

Within the past few years cultivation of the varieties of the Garden plum, Prunus domestica, has become more general in this state, but here again the birds promise to contest the industry. Plum-growing in the past has been confined almost entirely to the native sorts. These have for the most part exceedingly tough skins, and a bird of ordinary perseverance does not attempt to puncture them. The thinner skin of the garden varieties is one of their desirable features, but this makes them vulnerable to the attacks of the birds, and may prevent their extensive introduction.

I am extremely loth to declare war on the birds, but I do not know how to overcome the destruction which they work. The greater part of every agricultural and horticultural crop is required to meet the actual cost of producing the crop, and unless the crop brings some profit it had better not be grown. Suppose, then, that the birds only destroy one-fourth of the crop, which is much less than they are doing on our grounds this year, they have probably taken all the profit out of the business. There is no denying the fact that the birds render great service in the destruction of noxious insects. Leaving all sentiment out of the question, it is impossible to say whether we are able to successfully cope with these insect foes without the birds, even though we have made great strides in the application of insecticides. If a single species of bird were responsible for the injury the problem would be easier, but such is not the case. So many kinds have been observed eating the apples that we are led to believe that the habit is almost universal. It would be an interesting fact if some ornithologist could explain why the same species, which inhabit also the eastern states, are so much more destructive here than there. No one counts on the birds as an enemy to apple-growing in New York or New England, and why should they be here? The answer to this question might explain how to overcome the difficulty.

Agricultural College, Lincoln, Neb. *Fred W. Card.*

Notes from Santa Barbara.

To the Editor of Garden and Forest:

Sir,—In reference to a note by Professor Meehan on trees with triangular stems, recently quoted in Garden and Forest, it is worth mentioning that the most remarkable tree, Lyonothamnus asplenifolius, peculiar to the islands of Santa Cruz and Santa Rosa, has, as a rule, triangular stems up to a certain height. Here some other cause than the one suggested by Mr. Meehan for the Philadelphia tree must be looked for. Lyonothamnus is generally found growing on the shady side of the hills, and in clumps from very few to perhaps fifty trees together, apparently having sprung up from the very large roots which affect also a triangular shape. Seedlings or small plants are not to be found, owing to the large number of sheep grazing over the islands, but seedlings raised here have proved that they can endure safely the open sun. The hairs that cover the young growth under such conditions assume a pretty red color, contrasting well with the bright green of the glossy Fern-cut leaves.

Every year the number of individuals and of species of Palms which flower here is increasing. This year for the first time here, very likely for the first time in the United States, we have had in bloom Chamædorea Ziesmoncoides, from Mexico, one of the scandent species, and Erythræa armata, the Blue Palm from Lower California, with floriferous spadices over twelve feet long. This, the most striking of Fan Palms, while much prized now in California and in the gardens of the Mediterranean Riviera, is hardly known, I believe, in the eastern states.

The Melon Papaw, Carica Papaya, to which some attention has been drawn lately in agricultural papers, has never been and never will be a success in California, its soft, fleshy roots being too liable to decay during our rainy season, although the rainfall is so meagre. Other kinds of Papaw may, perhaps, be profitably grown, if not for their fruits, for the extraction of papaine, which is much employed in modern therapeutics. C. quercifolia, from Argentina and Paraguay, appears to be particularly rich in this alkaloid, and has proved perfectly hardy here, together with C. gracilis, with pink-veined, finely cut leaves, and C. candamarcensis, both from high altitudes in the Andes. Plants of all three have been blooming, the last mentioned since October, all through the winter, producing thousands of sweet-scented yellowish flowers, all staminate, and it was not until a few days ago that pistillate flowers

appeared. Fruits are now setting. The other kinds will behave in the same way, very likely.

Santa Barbara, Calif. *F. Franceschi.*

Notes from the South-west.

To the Editor of GARDEN AND FOREST:

Sir,—While the north and east have been suffering from drought, the summer of 1895 has been memorable as a wet season in the south-west. We always expect a more or less extended drought during the warm months, though usually this does not set in early enough to prevent fair crops and fine fruit. This year, however, there have been constant rains here for the last six months.

This wet weather has affected variously the farm, orchard and flower garden. It is estimated that at least fifty per cent. of the wheat in this section spoiled in the stacks. Much hay was ruined also, but the crop as a whole was so great that the loss was not felt. Of corn, our staple crop, the yield will be tremendous.

Showers by night and sunshine by day have given us the finest fruit I ever saw. The hills of this particular range of the Ozarks are full of Huckleberry-bushes. The leading fruit-buyer of our little town considers it an extra-good year when he buys 400 gallons of this luscious native fruit. This year he bought nearly 1,100 gallons, and refused 200 more for lack of a market. The astonishing increase was brought about (1) by the mammoth size the fruit attained, the largest berries reaching almost the size of small cherries; and (2) the long period of ripening, which was over a period of nearly seven weeks, instead of the usual month. Blackberries were brought in from the valleys by the tubful. Apples and plums rotted from lack of buyers. Peaches, which our growers think prefer dry weather, have been below the average in size and quality. All other fruit has been surpassingly fine. Our pears have often weighed sixteen and eighteen ounces; from one tree I gathered more than a peck that would average three-fourths of a pound apiece. The Ozarks may well boast of being one of the best fruit regions in the world. The fruit crop of this year is a revelation of what irrigation would do for us in ordinary years. Our land is so rough and mountainous that irrigation would of necessity be expensive, but with such an object-lesson before us there is little doubt that it would pay.

In the flower garden many of the annuals and bedding-plants were drowned out while yet small and feeble. Naturally, such exceptional weather has brought about some exceptional results. Crinums we always grow in the open ground in summer. Usually they bloom three or four times in the season with us. This year the leaves have grown to prodigious length, but not a flower-stalk has appeared. Hybrid perpetual Rose-bushes have grown to a height of eight and nine feet, but the flowers have been less plentiful than usual. In general the tendency has been toward an abnormal growth in length of shoots. Some shrubs have grown as much in height this season as in the previous four seasons put together. Yesterday we measured a summer's shoot of Snowball that was eight feet long. Paulownia imperialis, a strong specimen of which we grow as an annual shrub, cutting it to the ground each spring, so that new and fast-growing shoots are thrown up, has reached a height this year of over seventeen feet.

Take it, all in all, it has been a season whose like we may never see again. We have some curiosity as to whether these quick, soft growths will harden into ripened wood that will endure the winter.

McDonald County, Mo. *Lora S. La Mance.*

Rhus Poisoning.

To the Editor of GARDEN AND FOREST:

Sir,—I have read with interest your articles on the Poison Ivy, but none of the remedies which have been suggested by your correspondents have been set forth with any confidence. My inference is that science has as yet discovered no certain preventive or cure for this affliction. I venture, however, to say that the common Houseleek has proved very helpful to me. Some time ago I was severely poisoned, and a friend with whom I was stopping in the country advised me to get some Hen-and-Chickens, which I afterward learned was the common name for Sempervivum Tectorum, a plant often found in old country gardens. The directions were to take the fleshy leaves, put them in a bag made of old thin muslin, and after bruising them to a pulp lay the bag on the affected parts. I did not follow this direction closely, but merely crushed the leaves and spread them with the juice over the irritated places, with the result that the pain diminished, the poison ceased to spread and the pustules soon dried up. It may be that some persons are more susceptible to this remedy than others are, just as some persons are more susceptible to the poison, but it is worth trying.

Greenville, N. Y. *R. A.*

Myrosma cannæfolia (Calathea myrosma).

To the Editor of GARDEN AND FOREST:

Sir,—In the fall of 1893, Dammann & Co., of Naples, offered this plant with a glowing description of its merits as "a decorative plant of high order, with Canna-like leaves and profuse white flowers, and as being a valuable plant to cross with the popular dwarf Cannas." The plant has since then been offered here by dealers as the White Canna, with the same description. Purchasers of the plants have since that time been interested in the supposed treasure, which, however, refused to flower under any treatment. Old plants have at last flowered, and it is no great surprise to find them Hedychium coronarium, as the plants have always given indications of being a Gingerwort and not a Calathea. It is to be hoped that American florists will no longer continue to disseminate this plant under an entirely false name and description.

Elizabeth, N. J. *J. N. Gerard.*

Recent Publications.

Irrigation Farming. By Lute Wilcox. New York: Orange Judd Co.

The practice of irrigation is as old as agriculture. Indeed, it is an essential part of agriculture in many of the most fruitful regions of the world, and it is certainly a factor of growing importance in the cultivation of the soil over a large portion of the western half of the United States. Even in our eastern states the droughts which come in one or another part of the summer almost annually, make it worth while to consider the question whether it will not pay to take precautions against these arid periods by some arrangements for supplementing the summer rainfall. Where special crops, such as Asparagus, Celery and Strawberries, are grown, it has already been proved that irrigation, to a certain extent, will pay in the east, and wherever land is situated with a convenient supply of water that can be distributed over its surface the possible advantages of the practice are certainly worth considering. This book was written in Colorado, and, of course, the great bulk of it is a description of methods and appliances adapted for use on the great plains. But the various constructions that are here figured and described, with the methods of applying water to vineyards, orchards, gardens and field crops, will be interesting to any reader, and no tiller of the soil can read these chapters without having his views broadened and gaining ideas which he can put to practical use on his own land, wherever it may be.

Notes.

New lemons, from Malaga, are already here; the first lot of 1,000 boxes sold at wholesale auction on Friday brought $5.62½ to $6.37½ a box. Some 50,000 boxes of this fruit are expected here in the first week of October.

Ipomœas, which were sent out last spring under the name of the Imperial Japanese Morning Glories, have proved to be about all that was claimed for them in robustness of habit, in the luxuriousness of their leaves, many of which are mottled or checkered, and the rich marking and shading of their flowers. We apprehend they will not differ from other Ipomœas in the energetic way in which they reproduce themselves from seed, and that land once seeded with them will continue to produce them forever.

Mr. J. H. Hale is satisfied that the Japan plum in Georgia will form a more profitable market fruit even than peaches. The trees are strong growers and come into bearing a year after planting; in two years they yield half a bushel each, and more, of course, as they grow older. The fruit as grown in Georgia is very large and brilliantly colored, and has a tough skin that makes it easy to ship. Such varieties as the Burbank, for example, if picked while green, but fully grown, and wrapped in paper, can be carried for two or three weeks and will yet ripen into a rich, sweet fruit with fine color. The season of shipping ranges through June and early July. The

Willard ripens about May 20th, the Abundance from June 10th to June 15th, and the Burbank some ten days later.

New Zealand seems to have a progressive Department of Agriculture, if one can judge from the quality of the bulletins and leaflets which it sends forth from time to time. A circular of suggestions for Arbor Day, containing hints for the way in which the day should be celebrated, and particularly how the trees should be planted and cared for afterward, has been issued in ample time for their spring planting, which is, of course, our autumn. A list of trees which are suitable for various purposes in that country is published, and if the celebration is any way general and conducted on the lines laid down, it cannot be other than helpful in spreading the knowledge of and love for trees.

Mr. Andrew S. Fuller writes to *American Gardening* that young and thrifty roots of Hickories, although smooth and apparently without buds, have great power to generate adventitious ones, so that they can be used as cuttings for propagating these trees. Mr. Fuller has been growing some Pecans from root-cuttings, and he notices a great variety in the forms of the leaves, some of which, instead of being compound with eleven to fifteen leaflets, have single leaves eight inches long and half as broad; others have two small leaflets at the base of these which are scarcely larger than good-sized bracts. Of course, this may be nothing but a temporary variation, but it is an interesting departure from the normal type, especially since it occurs only among plants which are grown from root-cuttings.

Mr. Carman's Grape-vines were more heavily laden this year than they have ever been, one reason for which he ascribes to the fact that the rosebugs, although as numerous as in other seasons, found all the food they needed on Spiræas, Viburnums, Magnolias, etc., until the grapes were well set. The insect cares only for the pollen and the flowers and never attacks grapes of any size. He advises, therefore, intermingling the vines with plants which flower at the same time the Grape does and bear flowers which the chafers prefer to those of the Grape. The insect has very decided preferences, and it will devour the food it most relishes before it will attack anything less palatable. For example, on Mr. Carman's grounds it will destroy every flower of the Berckman's Grape, and even eat the thin smooth leaves before it will take up with vines of the pure Labrusca type.

As an example of plant-breeding on scientific principles, Mr. A. W. Slaymaker writes to the *Rural New Yorker* of the Oriole Strawberry. The blossoms of Bubach, a pistillate variety of vigor and productiveness, were fertilized with pollen from the Hoffman, an early southern variety, with vigorous habit and fine fruit which lacks size. The seeds from this cross were planted and two new varieties have been selected, one named Oriole and the other Ideal. Oriole has all the most desirable characteristics of the Bubach and an extra early ripening season, and in this way it combines the good qualities of both berries. It should be said that all the blossoms of the Bubach parent plant, except those which were fertilized with the southern sort, were taken off and the runners removed the year before, so as to give the fruit originating from the cross all possible vigor.

A fortnight ago, in one of our leading fruit-stores, we saw for the first time on sale in this city the apple known as the Red Beitigheimer. They are apples of the first size, cream-colored, with a crimson cheek, white firm flesh, a subacid sprightly flavor, altogether a superior dessert fruit in quality and appearance. Mr. J. B. Wagner, of Blue Stores, New York, who shipped the fruit, writes that it came from one tree planted twelve years ago, although he has set out many more in a new orchard. He describes the tree as a strong grower, with sturdy branches, dark green foliage and a prolific bearer of fair, even-sized and large fruit. Ellwanger & Barry, who have fruited this apple in their experimental orchard for many years, write that they have been so impressed with the size and beauty of the fruit that they have given the tree prominence in their catalogue. Dr. Hoskins writes that while it is said to be of German origin, this variety is not inferior to the Russian varieties in hardiness against cold. The season is about the same as that of the Duchess of Oldenburg, to which apple it is superior in dessert quality. Dr. Hoskins notes that in Vermont the codling moth is very partial to the tree, but this evil can be overcome by spraying. Whether owing to its scarcity, or to its beauty and real value, the apples in market here sold for twice as much as other varieties of the season.

It is estimated that more than two thousand tons of Paris green are annually used as an insecticide in the United States since it is the most rapid and effective of the arsenical preparations used for this purpose. The chief difficulty in using it is the readiness with which it settles to the bottom of the tank of spraying apparatuses. This is because it is less finely divided than London purple, a point in which the latter compound has a certain advantage. In the last number of *Insect Life* Dr. C. L. Marlatt explains that there is no reason for this coarseness of grain in Paris green, except that the market has demanded a dark-colored article, and the darker color is due to the larger size of the crystals. Paris green would be much more satisfactory as an insecticide if it were reduced to a fine powder, but it would then lose its intensity of color and become whitish, which, in popular estimation, would indicate adulteration. The fact is, that the manufacturer, who for years controlled the market, did so because he had discovered a method of crystallizing the product in unusually large particles, which were, therefore, very deeply colored. Of course, it was less valuable in this form, and yet the dark green large-sized crystals were more difficult to manufacture and more expensive, and the country went on using this for years, although a more effective poison could have been made for less money. In testing Paris green when reduced to fine powder, Dr. Marlatt found that it remained in suspension three times as long as the ordinary product did, while, undoubtedly, the fineness in division made it more effective against insects. The last step in the process of manufacturing Paris green is the combination with acetic acid. When, however, this acid is omitted, an impalpable powder, instead of a crystalline product, is secured, and this will remain in suspension almost perfectly for many hours. Experiments are now in progress to ascertain whether this can be used as a substitute for Paris green, to which it is so superior in fineness, while it costs only half as much.

New Jersey peaches of medium grades continue quite plentiful, $1.50 a basket at retail being an average price, while choice Smocks and Salways from western Maryland and Pennsylvania mountain orchards bring much higher prices. Brazen Rareripes and Keyport Whites are now coming from the extreme northern counties of New Jersey, and White Heaths are due. Yellow peaches have, however, preference over white fruit for preserving for home use. A small lot of Rawles Janet apples came from southern California last week, and they were considered by the trade as handsome as any apples ever seen in this city. The largest weighed twenty-four and a half ounces. The color is yellow, shaded with red and striped with crimson. The flesh, which is yellow, juicy and tender, has a vinous flavor, and by some is thought to resemble the Greening apple in taste. This fruit, while very popular in the south and south-west, has not yet been produced in California in great abundance, although many orchards are planted with it. More than 20,000 barrels of apples came into this city last week for local use, a few car-loads of them from western New York and Ohio, the bulk from near-by sections. Firm and well-colored Ben Davis, King, Gravenstein, Alexander and Twenty-ounce Pippins are selling to retail buyers for $2.75 to $3.50 a barrel, and a selected car-load of fancy Jonathans have commanded higher prices. The ordinary grades of apples now coming here can be bought as low as fifty and sixty cents to $1.25 and $1.50 a barrel in the wholesale markets. The plentiful supply of apples this year, at home and abroad, has made low prices, and recent sales of American apples in Liverpool have netted hardly more than half the returns of last year at this time. Greenings recently brought $1.50 to $2.37, and Kings $3.00 to $4.62 a barrel at wholesale in English markets, while $1.74 was an average price at a recent sale in Liverpool. Up to September 14th only 10,297 barrels of apples were sent to England from this country and Canada, 27,399 barrels less than last year, when our home crops were unusually small, but prices abroad were high. The crop in this country is estimated at 7,000,000 to 10,000,000 barrels. Sixty-two car-loads of California fruits were sold here in five days of last week. Among choice pears now coming from that state are Block's Acme. These surpass Beurre Clairgeau in size, and in color, which is olive and russet, covered with a blush on one side. Selected specimens of the largest size command the highest prices now paid for pears. The increasing use of Alligator pears is evident in the fruit-stores. In a large collection the variety of color which individual fruits show is worthy of study, ranging from solid green to bronze-purple, while some are almost black and others a rich red. In one of the fancy-fruit stores elaborate instructions for making salad of this fruit are furnished to buyers. The price, twenty-five cents each, indicates the demand for this fruit. A small shipment of mangoes arrived a few days ago, and some prickly pears or Indian figs, as they are known in the trade. The decorative rose-pink specimens of this latter fruit are used in making up steamer baskets.